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ABSTRACT

A randomized pretest-posttest-control group design study, replicated three times, each time with 24 subjects randomly selected and assigned to either a treatment or control group of 12 subjects each, was conducted to determine the effectiveness of a modified instructional strategy for accelerative and mastery learning of basic arithmetic by a male incarcerated population. A pretest was administered to test for initial group equivalence. The treatment phase lasted 6 weeks. Posttest for acquisition was administered, which was followed by a 2-week delayed test for retention. ANOVA allowed the rejection of the null hypotheses of no effect. The treatment resulted in higher posttest and retention test scores. (Author/MNS)

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A Modified Instructional Strategy for Accelerative and Mastery Learning of Basic Arithmetic by Male Incarcerated Adults

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A randomized pretest-posttest-control group design study, replicated three times, each time with twenty-four subjects randomly selected and assigned to either a treatment or control group of twelve subjects each, was conducted to determine the effectiveness of a modified instructional strategy for accelerative and mastery learning of basic arithmetic by a male incarcerated population. A pretest was administered to test for initial group equivalence. The treatment phase lasted six weeks. Posttest for acquisition was administered, which was followed by a two-week delayed test for retention. ANOVA allowed the rejection of the null hypotheses of no effect.

Although quite able to learn, the criminal chooses early not to learn. He occupies a seat in public schools, but has no constructive purpose in being there. Poor aca-

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demic performance is a matter of not caring, rather than ineptitude or inability. He may at times become very much interested in the school work, but does not make a sustained effort if he cannot complete a task instantly. He is generally promoted because of apparent intelligence, age, or lowered promotion standards. He is constantly envisioning criminal activity and is quick to learn the things of importance to him, both in public school and in the street.

Yochelson and Samenow (1977, 1982) note that the criminal personality is not fixed, but requires unique approaches if the criminal is to accept education and lead constructive lives. However, society continues to educate the criminal in confinement with teachers using traditional methods despite the fact that prisoners have, in one way or another, previously rejected or failed to master traditional pedagogical methods (Reagen, 1976). Furthermore, traditional curriculum and instructional techniques often do not alter his criminal thinking and behavioral patterns. After being released from prison, often having received a high school and/or college academic or vocational education, he generally commits many more crimes, using the knowledge that he has gained in prison education classes as well as on the "yard."

Deficits in arithmetic computation, as well as the need to overcome anxiety, inhibition and limitations of other cognitive abilities in adult felons call for the exploration of new instructional methodologies in prison education. Lozanov

(1971, 1975, 1978) proposed a desuggestive-suggestion system of instruction, incorporating emotive techniques, imagery, accelerated instruction, and frequent review of the material with a music background, which seemed to show both positive cognitive and affective results when conducted with other adult groups in well-controlled research design studies (Kurkov, 1977; Bordon and Schuster, 1976; Schuster, 1976; Gasner-Roberts and Brislan, 1984; Lemyze, 1978; Robinett, 1975). Another comprehensive learning strategy studied by Dansereau and his associates (1978, 1979) and having two major components, corresponding to the prereading and post-reading phases of studying, also seemed to hold great promise for adult groups. Finally, Yochelson and Samenow (1977, 1982) had developed a list of change strategies which seemed to be an essential component of prison education.

With the exception of the studies of Yochelson and Samenow (1977, 1982), apparently none of the above researchers have conducted studies on the effectiveness of their respective learning strategies with a criminal population. This writer suggested that there was no reason to doubt the potential uses of each of the above strategies with a prison population. It was therefore the purpose of this study to investigate the effects of a modified comprehensive learning strategy system for improving basic arithmetic achievement among male incarcerated adults. The system suggested by this writer incorporated strategies developed by Georgi Lozanov

(1971, 1975, 1978), by Donald Dansereau and his associates (1978, 1979), and by Samuel Yochelson and Stanton Samenow (1977, 1982).

It was this writer's hypotheses (1) that there would be no statistical difference at the end of a six-week period of instruction between the posttest means of the group scores of a treatment approach and a non-treatment approach as measured by the Wide Range Achievement Test, Arithmetic, Level II, (1978) and (2) that there would be no statistical difference at the end of a six-week period of instruction between the two-week delayed posttest means of the group scores of a treatment approach and a non-treatment approach as measured by the Wide Range Achievement Test, Arithmetic, Level II, (1978). Test for significance was at the .05 level.

Method

Subjects and Setting

The subjects were seventy-two (72) male incarcerated adults who had been referred for academic remediation. The median age was 24.6 years, with a range from 19 to 43. The median term for their commitment offense was two years. The subjects came from all socioeconomic and educational levels, as well as ethnic and crime groups. Referral reasons included very basic reading and arithemetic deficits, and attention to task problems. The facility was a medium security prison built in the 1960s as a camp and vocational training insti-

tution.

Selection of Subjects

The sample represented approximately ten percent of the prison population. The study was replicated three times. Each time twenty-four (24) subjects were randomly selected and assigned to either a treatment or control group, each with twelve (12) subjects, using a table of random numbers. Statistical analysis applied to the groups indicated no significant differences between the pretest means.

Independent Variable

A modified comprehensive learning strategy system, incorporating suggestopedic strategies developed by Lozanov (1971, 1975, 1978), comprehensive learning strategies studied by Dansereau and his associates (1978, 1979), and change strategies developed by Yochelson and Samenow (1977, 1982), constituted the independent or treatment variable in this study.

Dependent Variable

The dependent variable was the mastery of basic arithmetical computations as measured by the Wide Range Achievement Test, Arithmetic, Level II (1978).

The modified comprehensive learning strategy system involved three phases. In phases one, the subjects were taught to relax, to calm their mind, to restimulate previous pleasant learning experiences, and to generate an expectation of success. In phase two, previous material was

presented so that it could be encoded with images and verbal labels. The subjects were assisted in reorganizing, integrating, and elaborating of assignments. Imagery was used and new material was repeated in a passive, but receptive, state. In phase three, the subjects practiced for mastery through self-graded quizzes, through spatial reorganization of new material, and through a review cycle for increasing recall and retention. During all three phases, the "tools for change" list, developed by Yochelson and Samenow (1977, 1982) for criminal personalities, was utilized (See Appendix A.).

Preliminary Phase

The treatment groups were given formative tests for purposes of determining current mastery of basic arithmetic concepts and operations. At the start of each lesson the treatment groups had a set of activities to complete with the purposes of relaxing physically and mentally, and then generating an expectation of success for the lesson. Physical relaxation was followed by mind-calming and ended with goal-setting imagery, used to lead the treatment subjects to expect that they would learn the material well and easily (Lozanov, 1971, 1975, 1978; Dansereau et al, 1978, 1979). The non-treatment groups were given pretests only for purposes of determining current level. They were then informed of the math topics that were to be covered during the six weeks.

Presentation Phase

For the treatment groups the presentation phase had sub-phases of review and preview, dramatic presentation of material, followed by passive review. The review and preview demonstrated how the current lesson was related to the previous lesson, and simply or elaborately gave the big picture of the present lesson. Subjects were assisted in reorganizing, integrating, and elaborating a math lesson. The dramatic presentation used active, dynamic style of imagery to aid the subjects in generating their own mental imagery about the lesson. Classical music was used in the first (active) presentation, while baroque music was used in the second (passive) presentation. For the non-treatment groups the presentation phase consisted of material presented by conventional lecture method, each concept being demonstrated with arithmetic problems on a blackboard.

Practice Phase

The practice phase with its sub-phases had as its aims at getting the treatment subjects to use and apply the material in different ways, followed by daily and weekly reviews. First the treatment subjects repeated with little or major variations what the lesson was. Next they elaborated or did something with the material they had just learned. Finally at the end of each lesson they were given ungraded quizzes whose purpose was to show the subjects that they had learned

the material. The treatment subjects reviewed the material daily and weekly for three to five minutes. Grades were given on the basis of performance in announced or scheduled tests, including a final. The non-treatment groups completed workbook exercises and were given tests periodically only for purposes of determining marks. At no time were any subjects told that they were performing better than they were in fact doing.

Results

The present study was a randomized pretest-posttest-control group design. In order to analyze the data that were collected and to test the null hypotheses of no difference in group means on the posttests an F-statistic, derived mathematically using the analysis of variance (ANOVA) formulas, was utilized.

Pretest analysis cited evidence for initial group equivalence. Normality and homogeneity of variance were also indicated.

Table 1

ANOVA for Effects of Treatment on Posttest Scores

Source	SS	df	MS	F-ratio	p
Between	588.792	5	117.758	4.41	<.005
Within	1764.083	66	26.7285		
Total	2352.875	71			

In Tables 1 and 2, an "overall" analysis of variance was employed which indicated (p .005 and p .025 respectively) that the treatment may have had an appreciable effect on the posttest raw score mean acquisition and retention by the population in this study. However, the writer cautions that

Table 2

ANOVA for Effects of Treatment on Delayed Posttest Scores

Source	SS	df	MS	F-ratio	p
Between	613.069	5	122.6138	3.25	<.025
Within	2489.250	66	37.7159		
Total	3102.319	71			

the adequacy of instructional techniques should not be judged exclusively by test scores and feels that the study should be replicated by other researchers in order to discover which factor or factors, individually or in combination, brought about the effect.

Table 3

t-Test of Posttest Means of Treatment Groups vs Means of Control Groups

Group	Mean	Σx^2	s	SE_D	D	t	p
Treatment	31	144	4.5	1.3	5	3.85	<.01
Control	26	302		df=22		$t_{.01}=2.82$	

In Tables 3 and 4, a t-Test on the means of the three treatment groups versus the means of the three control groups raw scores resulted in t-values of 3.85 and 4.62 respectively, which was statistically significant at the .01 level, evidence that the treatment may have had an appreciable effect on the raw scores in groups like those this writer tested.

Table 4

t-Test of Delayed Posttest Means of Treatment Groups vs Means of Control Groups

Group	Mean	Σx^2	s	SE_D	D	t	p
Treatment	31	136	4.5	1.3	6	4.62	<.01
Control	25	305		df=22		$t_{.01}$=2.82	

Several additional results of this research warrant attention and further study. Some of the treatment subjects in this study noted (1) that they felt better about themselves, (2) that they felt better equipped to learn other subjects as a result of this six-week study, and (3) that they felt more in control of their lives, that is, that they could survive on the streets without resorting to crime, drugs, or alcohol. Only long-term studies will determine the potential effects of the several strategies in this study on self-concept, on transfer of skills learned in one situation to other situations, and on recidivism.

Discussion

The results of this study seem to indicate that the treatment factor, a modified instructional strategy for accelerative and mastery learning, was more effective for achieving significant posttest mean acquisition and retention.

Although the current study was not without limitations, it did represent encouraging indications that the comprehensive learning strategy system could be implemented with an incarcerated adult population with cognitive deficits. The uniqueness of the approach was that several learning strategies were brought together to form a holistic functional methodology which this population appeared to easily acquire.

Several aspects of the approach have important implications for education in general, and for the field of prison education in particular. Some of these include the importance of the techniques used to relax, to calm, and to generate an expectation of success by the restimulation of previous pleasant learning experiences, the highly suggestive nature of this population, the power of visualization and goal imagery in education as well as its potential in reducing criminal thoughts and recidivism, the presentation and review cycle, and the recognition of the importance of the role of unconscious mental processes. Emphasis is placed on the belief that this population has choice and

will, and that through visualization ang goal imagery the criminal personality can change; the criminal can be educated and can lead a constructive life.

Additional studies are necessary to identify and evaluate the effects of the elements in this study individually and in combination on the accelerative and mastery learning of basic arithmetic, as well as other cognitive and affective skills, by male incarcerated adults, by older populations, and by younger populations.

Appendix A

Tools for Change:
The Criminal Personality

1. Do not regard as mentally ill.
2. Do not court the criminal's favor or appear at all sympathetic.
3. Be firm, consistent, and evocative without being provocative.
4. Instead of trying to alleviate a feeling of guilt in the criminal, try to increase it.
5. Control instruction and counseling sessions.
6. Disallow excuses, blaming of others, and the victim stance in its various forms.
7. Educate about the responsible world.
8. Do not compliment the criminal on improvement; focus constantly on corrections to be made, no matter how much progress there seemed to have been made.
9. Direct the subject to live with their fears, endure discomfort, take the world as they find it, and make the best of it, rather than demand a different world.
10. Emphasize that the subject has choice and will.

Yochelson and Samenow (1977)

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